

7-2. Backlight driving

The backlight system is an edge-lighting type with white-LED.

The characteristics of LED are shown in the following table.

(It is usually required to measure under the following condition.

condition:If=130mA,Ta=25°C±2°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
LED voltage	V _L	—	(22)	—	V	
LED current range	V _L	—	(130)	—	mA	Value for one channel
Number of circuit channel		—	(2)	—		[Note 1]
Lamp power consumption	W _L	—	(5.7)	—	W	[Note 2]
Life time (LCD module)	L _L	—	(50,000)	—	Hour	If=130mA [Note 3]

[Note 1] The LED backlight is composed by 2 channels 5 from which 7 LED is connected with the series.

[Note 2] Calculated value for reference (I_L × V_L ×2 channel)

[Note 3] Above value is applicable when lamp (the long side of LCD module) is placed horizontally.

(Landscape position)

Life time is defined that it applied under this condition

(Continuous turning on at Ta=25 °C, If=130mA)

- Brightness becomes 50% of the original value under standard condition.

In case of operating under higher temperature environment, the LED exhaustion is accelerated the brightness becomes lower.

8. Timing Characteristics of input signals

Timing diagrams of input signal are shown in Fig.2.

8-1. Timing characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	23	25.18	28.33	MHz	-
	High time	Tch	5	-	-	ns	-
	Low time	Tcl	10	-	-	ns	-
	Duty ratio	Th/T	40	50	60	%	-
Data	Setup time	Tds	5	-	-	ns	-
	Hold time	Tdh	10	-	-	ns	-
Horizontal sync. signal	Cycle	TH	30.00	31.78	-	μs	-
			750	800	900	clock	-
	Pulse width	THp	2	96	200	clock	-
Vertical sync. signal	Cycle	TV	515	525	560	line	-
	Pulse width	TVp	1	-	34	line	-
Horizontal display period		THd	640	640	640	clock	-
Hsync-Clock phase difference		THc	10	-	Tc-10	ns	-
Hsync-Vsync phase difference		TVh	0	-	TH-THp	clock	-
Vertical data start position		TVs	34	34	34	line	-

[Note] In case of lower frequency, the deterioration of display quality, flicker etc.,may be occurred.

8-2. Horizontal display position

The horizontal display position is determined by ENAB signal and the input data corresponding to the rising edge of ENAB signal is displayed at the left end of the active area.

Parameter		symbol	Min.	Typ.	Max.	Unit	Remark
Enable signal	Setup time	Tes	5	-	Tc-10	ns	-
	Pulse width	Tep	2	640	TH-10	clock	-
Hsync-Enable signal phase difference		THE	44	-	TH—664	clock	-